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BATTERY CHARGER SEC-1215A (WITH DIP SWITCH)
ADJUSTMENT PROCEDURE

Please note that you would need to open the L shaped top cover of the unit by removing 4 screws on the side opposite to the power cord. Slide the top cover outwards slowly by about 1 inch. Then remove the 2 connecting wires to the ammeter (The wires have female quick disconnect for connection to the ammeter). Mark their positions (one is positive and the other is negative) for proper re-connection. Remove the female quick disconnects for the LED and the fan. The top cover will now slide out completely. Re-connect the ammeter (the top cover will be out) and the LED for the period of the adjustment.

WARNING! It is very important that you connect the ammeter in the circuit before powering on the unit. If the unit is powered on without the ammeter connection, the unit will become defective. Carry out the adjustments as desired. Re-assemble the unit in the reverse order. Do not forget to connect the ammeter wires, the LED and the fan.

IMPORTANT NOTE

The output of the charger has one common negative terminal and 3 positive terminals to enable connection of 3 banks of batteries and also to provide battery isolation between the three banks. Each of the positive terminals of the three banks is fed through a series connected isolating diode. This isolating diode has a forward voltage drop of 0.8 V. In order to compensate for this forward voltage drop, the output voltage of the charger before this isolating diode is kept higher by 0.8 V. This forward voltage drop of 0.8 V across the isolating diode occurs only when current passes through the diode. If there is no current flow through this diode (no battery or DC load is connected to the respective output terminal), the voltage drop of 0.8 V does not take place. Therefore, when no battery or any other DC load is connected to the positive output terminals of the 3 banks, their voltages will read 0.8 V more than the specified operating voltages. Similarly, the output voltages at the positive terminal of the bank which is not loaded (i.e. A battery or any other DC load is not connected to that bank), will measure 0.8 V higher than the voltage at the terminal of the loaded bank(s)

Example:
Let us say that we have selected "Flooded/AGM" battery (factory preset)
Let us say that only 1 battery or load is connected between the common negative terminal and the positive terminal of the 1st bank (the first positive terminal next to the common negative terminal: here-in-after designated as "**Bank 1**") and nothing is connected to the remaining 2 banks, here-in-after designated as "**Bank 2" and "Bank 3**". The voltage readings at the positive terminals of the 3 banks will be as follows: (Dip switches in the preset condition for flooded or AGM batteries):

	Bank 1 (Loaded)	**Banks 2 and 3 (Not connected)**
Float stage	13.5 V	14.3 V (0.8 V higher)
Absorption stage	14.4 V	15.2 V (0.8 V higher)

This is a 3 step charger. When a charger is connected to a deeply discharged battery, the battery will try to draw very high current from the charger. SEC-1215A limits this current to a maximum of 15 A. A deeply discharged battery will first be charged at 15 A constant current in the Bulk **charging Stage (Stage 1).** When approx. 70% to 80% of the capacity has been restored, the charger will switch to constant voltage **Absorption Stage (Stage 2)** charging at 14.4 V (when "flooded / AGM" type of battery is selected with the DIP switches) or 14 V (When "Gel Cell" type of battery is selected with the DIP switches). As the balance 20% to 30% of the capacity is further restored, the charging current starts reducing. When the current reduces to approx. 1.5 A to 2 A, almost 100% capacity would have been restored and the charger switches to the constant voltage **Float Stage (Stage 3)** of 13.5 V. The switching between **Absorption** and **Float** stages is done by sensing the load current being drawn as follows:

- From Absorption to Float at approximately 1.5 to 2 A
- From Float to Absorption at approximately 2 A to 3 A

ADJUSTMENT POTENTIOMETERS

5 potentiometers have been provided to adjust various parameters as follows:

VR-1: Adjusts the current limit - preset at 15 A. **Do not disturb this potentiometer)**
VR-2: Adjusts the Absorption voltage when the Dip Switch SW1 is set for Flooded / AGM (Preset at 14.4 V)
VR-3: Adjusts the Absorption voltage when the Dip Switch SW1 is set for Gel Cell (Preset at 14 V)
VR-4: Adjusts the Float Voltage (preset at 13.5 V)
VR-5: Adjusts the threshold of change between Absorption and Float (Preset at 1.5 A to 2 A for change over from Absorption to Float and 2 A to 3 A for change over from Float to Absorption .**Do not disturb this potentiometer)**

TEST EQUIPMENT REQUIRED

DC Voltmeter, here-in–after designated as "**V1**"
DC Ammeter, 20 A, here-in-after designated as "**A1**"
20 ohm, 300 watts variable resistor as load (for example, Ohmite E300K20R with Ohmite Adjustable Lug 1974-A), here-in-after designated as "**R1**"

NOTE: The variable resistance load **R1** is connected between the common negative terminal and the positive terminal "**Bank 1"**. All voltage measurements are taken between this positive terminal "**Bank 1"** and the common negative terminal. The other 2 terminals – "**Bank 2**" and "**Bank 3**" are not connected to any load and their voltage readings will be 0.8 V higher as explained above and should be disregarded.

SET UP FOR ADJUSTMENTS AND TESTING

- Disconnect all batteries / other DC loads, if connected to the charger
- Unplug the charger from the AC outlet

Connect as follows:

- Positive terminal **Bank 1** → ammeter **A1** → variable load resistor **R1** → the common negative terminal (**A1** and **R1** are in series)
- Positive terminal **Bank 1** → DC voltmeter **V1** → the common negative terminal

PROCEDURE # 1

ADJUSTING FLOAT VOLTAGE

- Unplug the charger from the AC outlet
- Set the DIP switches for "loaded battery" (SW1 off, SW2 off)
- Adjust the variable resistor **R1** to around 9 Ohm.
- Plug the unit into the AC outlet; switch on the AC power to the charger
- Adjust the variable load resistor **R1** so that the current is 1.5 A. The voltage at the output terminal **Bank 1** will be the pre-set float voltage of 13.5 V as explained above, the other 2 terminals will read 0.8 V higher. **Disregard the voltages at these terminals**
- Adjust potentiometer **VR-4** to change the float voltage to the desired value – turn clock-wise to increase. The range is 12 V to 14 V at 1.5 A load (with **VR-2** and **VR-3** in the factory preset condition)
- Disconnect AC power and reset the DIP switches to their original position

PROCEDURE # 2

ADJUSTING ABSORPTION VOLTAGE FOR FLOODED / AGM (Preset at 14.4 V)

- Unplug the charger from the AC outlet
- Set the DIP switches for "Flooded / AGM battery" (SW1 off, SW2 on)
- Adjust the variable resistor **R1** to around 3 Ohm.
- Plug the unit into the AC outlet; switch on the AC power to the charger

- Adjust the variable load resistor **R1** so that the current is 4 A. The voltage at the output terminal **Bank 1** will be the pre-set Absorption Voltage of 14.4 V as explained above, the other 2 terminals will read 0.8 V higher. **Disregard the voltages at these terminals**
- Adjust potentiometer **VR-2** to change the Absorption Voltage at **Bank 1** to the desired value – turn clock-wise to increase. Remain within 13.2 V to 15.5 V
- When **VR-2** is adjusted as above, the float voltage setting gets disturbed. Hence, subsequent to this adjustment, check and adjust the float voltage to the desired value as per **PROCEDURE # 1** above.

PROCEDURE # 3

ADJUSTING ABSORPTION VOLTAGE FOR GEL CELL (Preset at 14 V)

- Unplug the charger from the AC outlet
- Set the DIP switches for "Gel Cell battery" (SW1 on, SW2 off)
- Adjust the variable resistor **R1** to around 3 Ohm.
- Plug the unit into the AC outlet; switch on the AC power to the charger
- Adjust the variable load resistor **R1** so that the current is 4 A. The voltage at the output terminal **Bank 1** will be the pre-set Absorption Voltage of 14 V as explained above, the other 2 terminals will read 0.8 V higher. **Disregard the voltages at these terminals**
- Adjust potentiometer **VR-3** to change the Absorption Voltage to the desired value – turn clock-wise to increase. Remain within 13.2 V to 14.3 V
- When **VR-3** is adjusted as above, the float voltage setting gets disturbed. Hence, subsequent to this adjustment, check and adjust the float voltage to the desired value as per **PROCEDURE # 1** above